

### The Key to Communication

The information is critical. The timing and coordination between systems is the key to efficient operation and maximizing system uptime. A highly reliable control communications solution is required to do the job and enhance the overall system performance.

### Quick, Efficient Communications

Controller Link is Omron's powerful, deterministic communications network, ideal for exchanging large amounts of information quickly and efficiently. Engineered to meet the strict requirements of demanding applications, Controller Link has the capability to deliver your mission critical data safely and on time, every time.

- Plug-and-Play Configuration
- Automatic Data Link and Custom Data Exchange Between Network Nodes
- Deterministic, Token Passing Bus or Ring Network Architecture
- Supports Transparent Multi Network Routing and Gateway Functions Through Omron's CS1 Controller
- Redundant Fiber Media Provides Automatic Loop-Back on Fault Detection
- Advanced Diagnostics, Status and Error Detection
- Three Media Options:
  - Shielded Twisted Pair
  - 62.5 Micron Fiber Optic Cable
  - 200 Micron Fiber Optic Cable for Extended Distance and Noise Immunity



# Features and Functions

## ■ Plug-and-Play Network Configuration

- Modules install easily with switch settings and are ready for power up.

## ■ Automatic 'Data Link' and Event Ladder Instructions

- 'Data Link' automatically shares memory areas between nodes on start up.
- 'Message Services' send data on event between specified nodes using simple ladder SEND/RECEIVE and COMMAND instructions.

## ■ Media Redundancy and Advanced Diagnostics

- Fiber has redundant transmission paths with automatic loopback in case of media failure.
- Fiber optic cable provides additional reliability and noise immunity.

## ■ Flexible Media Options

- Shielded twisted pair (STP) for quick inexpensive installation.
- Fiber optic cable provides additional reliability and noise immunity.

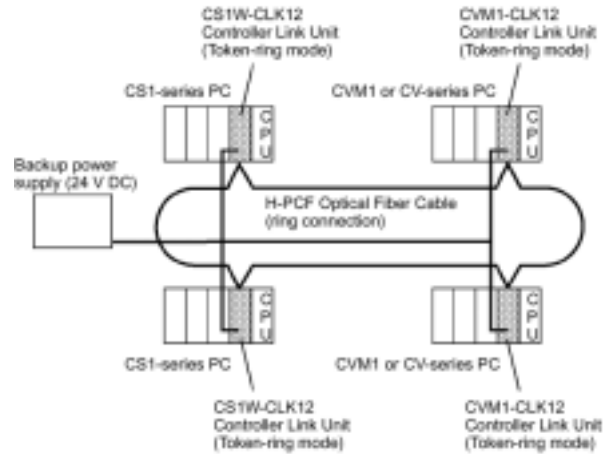
## ■ Transparent Routing and Gateway

- Multi-level network configurations support 'transparent' Gateway and routing functions.
- Expand systems beyond a single network segment.
- Multi-level system functionality is supported by CX programmer, CX Server and FINS Gateway based software tools.
- Easy access to system information without complex programming and system modifications.

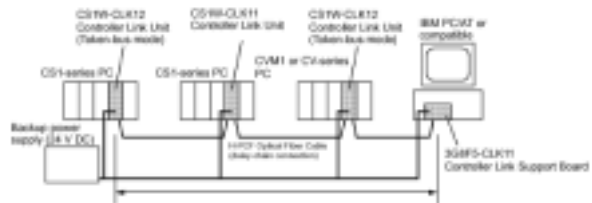
Summary of Controller Link Functions



Back up Power Supply in Token Ring Fiber Configuration



Token Bus Configuration



# Specifications

| Item  | Shielded Twisted Pair   | Fiber Optic Media   |  |
|---|---|---|--|
| Network Topology  | Multi-drop Bus  | 200 Micron  | 62.5 micron                                  |
|   |   | Daisy Chain Bus (token), Token Ring   |  |
| Transmission Distance /<br>Baud Rate<br>Max. Distance Between Nodes | Variable Baud Rate w/ distance<br>2Mbps: 500M (1640 ft)<br>1Mbps: 800M (2624 ft)<br>500Kbps: 1KM (3280 ft)  | 20Km (65,600 ft)<br>2Mbps<br>800M (2624 ft)   | 30km<br>2 Mbps<br>2km 62.5/125<br>1km 50/125 |
| Media   | Shielded Twisted Pair<br>2 signal lines, 1 shield<br>Belden # 9207  | Omron Duplex Fiber Optic<br>Cable 200 micron  | 62.5 / 125<br>50/125                         |
| Connections   | CV/CVM1, C200H Alpha, CS1,<br>CQM1H, Computers (ISA, PCI)   | CV/CVM1, CS1, Computers (ISA, PCI)  |  |
| Maximum Number of Nodes   | 32  | 62  |  |
| Communications Functions  | Data Link - Automatic or Custom settings available<br>Message Service (Ladder Commands)   |   |  |
| Data Link Words Per Network   | 32,000 words maximum  | 62,000 words maximum  |  |
| Data Link Words Per Node  | Automatic Transmission Area Per Node: 1000 words maximum<br>Send/Receive (maximum words):<br>C200HX/HG/HE, CQM1H, CV/CVM1: 8000 words max per unit<br>CS1: 12000 words max per unit<br>ISA / PCI Board: 32,000 words maximum Wire<br>62,000 words maximum Fiber Optic |   |  |
| Message Length  | 2012 bytes maximum (including header), 1000 Words Data  |   |  |
| RAS Functions   | Polling Node Back Up Function<br>Power up self diagnostics<br>Echoback and broadcast test<br>Watchdog timer<br>Error Log function   | Polling Node Back Up Function<br>Power up self diagnostics<br>Echoback and broadcast test<br>Watchdog timer<br>Error Log function<br>-Node Bypass – Aux. Power Supply<br>-Redundant Transmission Path (Token Ring Only)<br>-Loopback Test (Token Ring Only)<br>-Media Failure detect and notification<br>-Auto Read Node Connection |  |
| Error Control   | Manchester Code Check, CRC  |   |  |
| Standards   | UL/CSA/CE   |   |  |

## ■ Controller Link Network Service Boards (NSB) and Software

The following table outlines the compatibility issues and driver support software which is included with the purchase of each Network Service Board (NSB)

| Item   | ISA Board   |               | PCI Board  |  |
|--|---|---------------|--|--|
|  | Wire  | Fiber Optic   | Wire   | Fiber Optic  |
| Part Number                                      | 3G8F5-CLK21-E   | 3G8F5-CLK11-E | 3G8F7-CLK21-E  | 3G8F7-CLK12-E<br>3G8F7-CLK52-E   |
| Number Installed Per Computer                    | 1 maximum   |               | 4 maximum  |  |
| Software Media                                   | 1.44 FDD  | 1.44 FDD      | CDROM  | CDROM  |
| Package Contents                                 | -ISA Board<br>-Floppy Disk<br>-Operation Manual W307<br>-Operation Manual W308<br>-Registration Card<br>-Software License                                 |               | -PCI Board<br>-CDROM<br>-Operation Manual<br>-Comm Connector<br>-Registration Card<br>-Software License  | -PCI Board<br>-CDROM<br>-Operation Manual<br>-Fiber Bracket<br>-Power Supply Connector<br>-Switch Label<br>-Software License |
| Computer Requirements                            | IBM PC/AT or Compatible<br>CPU: 386 or higher<br>Main Memory: 4MB minimum<br>HDD: 2MB minimum free<br>FDD: 1.44 required for installation                 |               | IBM PC/AT or compatible<br>CPU: Intel Celeron 400MHz or better<br>Main Memory: 32MB minimum<br>Slots: 1 PCI Bus<br>HDD: 70 MB minimum free<br>CDROM: required for installation<br>Display: VGA (640x480) minimum |  |
| Compatible Operating Systems                     | For Libraries, IBM PC DOS Version 7.0 or MSDOS Version 6.2<br>(Windows 3.1, 95, 98, 2000, NT4 using FGW - Purchased separately)                           |               | For Libraries, Windows 98, 2000<br>NT4.0 (Service Pak 3 or later)<br>(Windows 95, 98, 2000, NT4 using FGW - Purchased separately)  |  |
| Compatible Language                              | For Libraries, Microsoft C Version 7.0 Large Model (CLKMSC.LIB)   |               | For Libraries, Microsoft Visual C++ Version 6.0 (Service Pak 3)  |  |
| Software Drivers and Utilities Included with NSB | -Controller Link Support Software (Optional functions are included with CX Programmer)<br>-C Library (CLKMSC.LIB)<br>-(FINS Gateway purchased separately) |               | -FINS Gateway Controller Link Runtime-Embedded Edition Version 3.0 (Full FGW Version 3.0 is optional)<br>-PCI NSB Set Up and Diagnostic Utilities<br>-C++ Library  |  |

## ■ Controller Link Network Service Board Compatibility with Omron Software Tools

The following table outlines the compatibility issues between other Omron software tools and the Controller Link NSBs. Software version listed is the earliest board-compatible version. For information on software versions not listed, contact an Omron representative. This table is correct as of 5/01/01.

| Item                             | ISA Board  |               | PCI Board  |                                |
|----------------------------------|--|---------------|--|--------------------------------|
|                                  | Wire   | Fiber Optic   | Wire   | Fiber Optic                    |
| Part Number                      | 3G8F5-CLK21-E  | 3G8F5-CLK11-E | 3G8F7-CLK21-E  | 3G8F7-CLK12-E<br>3G8F7-CLK52-E |
| CX Server                        | Version 1.5  |               | Under Development  |                                |
| CX Programmer                    | Version 1.2 (CX Server Ver. 1.5)   |               | Under Development  |                                |
| CX Motion                        | N/A.   |               | N/A.   |                                |
| CX Simulator                     | N/A.   |               | N/A.   |                                |
| CX Supervisor                    | Version 1.0 (CX Server Ver. 1.5)   |               | Under Development  |                                |
| CX Server LITE                   | Version 1.0 (CX Server Ver. 1.5)   |               | Under Development  |                                |
| CX Server OPC                    | Version 1.0 (CX Server Ver. 1.5)   |               | Under Development  |                                |
| CX Protocol                      | N/A.   |               | N/A.   |                                |
| CX Process                       | N/A.   |               | N/A.   |                                |
| Controller Link Support Software | Supported in Version 2.0   |               | Not Supported. Use Utility Software included w/NSB.  |                                |
| FINS Gateway                     | FGW Version 2.0 or Version 3.0   |               | -FGW CLK Version 3.0 Embedded is included with purchase of NSB.<br>-Requires FGW Version 3.0 Runtime License purchase to add Host Link, Ethernet, Sysmac Link, etc.<br>-FGW V2.0 and V3.0 can not be installed on the same computer. |                                |
| Compolet                         | Version x.x (FGW V 2.0 or 3.0)   |               | Version 2.61 includes FGW Version 3.0 Runtime License  |                                |
| Value Aid Pak                    | Version x.x (FGW Version 2.0 or 3.0)   |               | Version x.xx includes FGW Version 3.0 Runtime License.   |                                |
| PLC Reporter                     | Supported.   |               | Version x.xx includes FGW Version 3.0 Runtime License.   |                                |
| Wonderware Intellution           | -V2.0 Embedded Edition included from ISV<br>-V3.0 may be purchased separately from Omron.<br>-Uninstall Version 2.0 first<br>-No change required by ISV. |               | -Not supported by FGW Version 2.0<br>-V3.0 must be purchased separately from Omron.<br>-Uninstall V2.0 first. Functions limited to V2.0.<br>-No change required by ISV.  |                                |

## Ordering Information

### ■ Controller Link Modules, Computer Network Service Boards (NSBs)

| Media Type   | Network Connection                    | Description  | Part Number   |
|--|---------------------------------------|--|---------------|
| Wire (STP= Shielded Twisted Pair)                  | CV/CVM1 Series                        | Controller Link Module, STP                              | CVM1-CLK21    |
|  | C200HX/HG/HE Alpha                    | Controller Link Module, STP                              | C200HW-CLK21  |
|  |                                       | Bus Connector -for connecting 1 CLK21                    | C200H-CE001   |
|  |                                       | Bus Connector -for connecting 2 CLK21                    | C200H-CE002   |
|  |                                       | Bus Connector -for connecting 1 CLK21 and PC Card Module | C200H-CE012   |
|  |                                       | Comm Board, for Bus Connector                            | C200HW-COM01  |
|  |                                       | Comm Board w/RS232, For Bus Connector                    | C200HW-COM04  |
|  | CS1 Series                            | Controller Link Module, Wire (STP)                       | CS1W-CLK21    |
|  | CQM1H Series                          | Controller Link Module, Wire (STP)                       | CQM1H-CLK21   |
|  | Computer - ISA                        | Controller Link NSB, ½ Slot ISA, Wire                    | 3G8F5-CLK21-E |
| Computer - PCI                                     | Controller Link NSB, ½ Slot PCI, Wire | 3G8F7-CLK21-E  |               |
| Fiber Optic (200 Micron) (See Note 1.)             | CV/CVM1                               | Controller Link Module, H-PCF 200 micron                 | CVM1-CLK12    |
|  | CS1                                   | Controller Link Module, H-PCF 200 micron                 | CS1W-CLK12    |
|  | Computer - ISA                        | Controller Link NSB, ½ slot, 200 micron                  | 3G8F5-CLK11   |
|  | Computer - PCI                        | Controller Link NSB, ½ slot, 200 micron                  | 3G8F7-CLK12-E |
| Fiber Optic (62.5/125 50/125 Micron) (See Note 3.) | CV/CVM1                               | Controller Link Module, 62.5 Fiber                       | CVM1-CLK52    |
|  | CS1                                   | Controller Link Module, 62.5 Fiber                       | CS1W-CLK52    |
|  | Computer - PCI                        | Controller Link NSB, ½ slot, 62.5 micron                 | 3G8F7-CLK52-E |

- Note:**
1. Fiber optic cable and connectors not included with Modules. Each module requires 2 connectors purchased separately from Omron. See table below for information.
  2. Consult Omron for Network configuration assistance.
  3. 62.5 Fiber optic Cable and Connectors not provided by Omron. Must be purchased separately. Cable assemblies must be assembled, installed and certified by a qualified provider.

### ■ Literature

| Item             | Description  | Part Number |
|------------------|--|-------------|
| Operation Manual | Controller Link Wire Modules, CS1, C200HW, CVM1, CQM1H | W309        |
| Operation Manual | Controller Link Fiber Optic Modules, CS1, CVM1         | W370        |
| Operation Manual | Controller Link Network Support Boards - ISA           | W307        |
| Operation Manual | Controller Link Network Support Boards - PCI           | W383        |
| Operation Manual | Controller Link Support Software V 2.0                 | W369        |

### ■ H-PCF 200 Micron Fiber Optic Cable, Connectors and Termination Kit

| Item                                  | Type    | Description                            | Part Number          |
|---------------------------------------|---------|--|----------------------|
| Fiber Optic Cable                     | Zipcord | Fiber Cable, 200 micron, 50M, Zipcord  | FCS-HCP-ZIPCORD-50M  |
|                                       | Duplex  | Fiber Cable, 200 micron, 50M, Duplex   | FCS-HCP-DUPLEX-50M   |
|                                       |         | Fiber Cable, 200 micron, 100M, Duplex  | FCS-HCP-DUPLEX-100M  |
|                                       |         | Fiber Cable, 200 micron, 250M, Duplex  | FCS-HCP-DUPLEX-250M  |
|                                       |         | Fiber Cable, 200 micron, 500M, Duplex  | FCS-HCP-DUPLEX-500M  |
|                                       |         | Fiber Cable, 200 micron, 1000M, Duplex | FCS-HCP-DUPLEX-1000M |
| Connectors<br>(2 Required per Module) |         | Connector Kit, Full Lock               | S3200-COCF2011       |
|                                       |         | Connector Kit, Half Lock               | S3200-COCF2511       |
|                                       |         | Inline Adapter                         | S3200-COAT2000       |
| Termination Kit                       |         | Termination Kit, 200 Micron Cable      | FCS-PK230-OMRON-JK-6 |

- Note:**
1. Assembly of Fiber Optic Cables and connectors requires special termination procedures.
  2. Tested and Certified Pre-assembled Fiber Optic Cables are available. Please contact Omron for additional information.
  3. Zip cord Fiber Cable is for use in cable trays. It is not recommended for pulling through conduit.
  4. Duplex cable has an external jacket and kevlar stress members, designed for added strength. There are 2 additional members used to assist in pulling cable through conduit.
  5. For additional information regarding installation of Fiber Optic Cable or connectors, please contact Omron.

### ■ Controller Link Support Software

| Item             | Description   | Part Number        |
|------------------|---|--------------------|
| Support Software | Controller Link Support Software Version 2.0<br>Set Custom Data Link, Routing Table, Network Diagnostics, status, error logs, Use RS232 or ISA NSB Interface to the Network<br>Not Compatible with PCI NSB's ( Use Utility software supplied with PCI NSB)<br>Works with any CLK Module, or ISA NSB's<br>Windows 95, 98 compatible only | C200HW-ZW3AT2-E-V2 |
| CX Programmer    | CX Programmer (Version 2.0)<br>Includes Functionality of Controller Link Support Software<br>Not compatible with PCI NSB's (under development)<br>See Omron Software Compatibility Table for details.   | WS02-CXPC1-EVX.X   |

### ■ Omron Network/Communications Interface Software

| Item                                | Description                      | Part Number      |
|-------------------------------------|----------------------------------|------------------|
| API (Application Program Interface) | FINS Gateway Version 3.0 Runtime | See Note         |
| CX Programmer                       | CX Programmer                    | WS02-CXPC1-EVX.X |

- Note:** For more information on embedded communications interfaces for all Omron Networks, please contact Omron Product Marketing.



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